

### **AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Previously presented) A radioactive microsphere comprising not less than 99% by weight of a crystal of an oxide of yttrium which contains 47% by weight or more of radioactive yttrium, and the balance of inevitable impurities, wherein the microsphere is in the shape of a sphere.
2. (Original) The radioactive microsphere according to claim 1, wherein the oxide crystal consists essentially of  $Y_2O_3$ .
3. (Original) The radioactive microsphere according to claim 1, wherein the oxide crystal consists essentially of  $YPO_4$ , or a mixture of  $Y_2O_3$  and  $YPO_4$ .
4. (Original) The radioactive microsphere according to claim 1, wherein the microsphere has a diameter of 1 to 100  $\mu m$ .
5. (Original) The radioactive microsphere according to claim 1, wherein the microsphere has a diameter of 2 to 30  $\mu m$ .
6. (Previously presented) The radioactive microsphere according to any one of claims 1 to 5, wherein the microsphere is coated with a film comprising at least one of the compounds selected from the group consisting of silica ( $SiO_2$ ), titania ( $TiO_2$ ), alumina ( $Al_2O_3$ ), iron (III) oxide ( $Fe_2O_3$ ), silicon nitride ( $Si_2N_3$ ),  $SiN$ ,  $Si_3N_4$ ), aluminum nitride ( $AlN$ ), titanium nitride ( $TiN$ ), iron nitride ( $Fe_2N$ ,  $Fe_4N$ ), silicon carbide ( $SiC$ ) and titanium carbide ( $TiC$ ).
7. (Original) The radioactive microsphere according to claim 6, wherein the film has a thickness of 0.01 to 5  $\mu m$ .

8. (Previously presented) A method of producing a radioactive microsphere, the method comprising preparing a microsphere having not less than 99% by weight of a crystal of an oxide of yttrium which contains 47% by weight or more of non-radioactive yttrium, and the balance of inevitable impurities through melting of a starting material wherein the microsphere is formed into a sphere, followed by irradiating with an effective dosage of slow neutrons to turn non-radioactive yttrium into a radioactive element.

9. (Cancelled)

10. (Previously presented) The method according to claim 8, further comprising coating the microsphere with a film after preparing the microsphere and before irradiating with an effective dosage of slow neutrons, the film comprising at least one of the compounds selected from silica ( $\text{SiO}_2$ ), titania ( $\text{TiO}_2$ ), alumina ( $\text{Al}_2\text{O}_3$ ), iron (III) oxide ( $\text{Fe}_2\text{O}_3$ ), silicon nitride ( $\text{Si}_2\text{N}_3$ ,  $\text{SiN}$ ,  $\text{Si}_3\text{N}_4$ ), aluminum nitride ( $\text{AlN}$ ), titanium nitride ( $\text{TiN}$ ), iron nitride ( $\text{Fe}_2\text{N}$ ,  $\text{Fe}_4\text{N}$ ), silicon carbide ( $\text{SiC}$ ) and titanium carbide ( $\text{TiC}$ ).

11. (Previously presented) The method according to claim 8, wherein the oxide crystal further contains an amount of phosphorus, and the method further comprises heating the microsphere in an oxidizing atmosphere after preparing the microsphere and before irradiating with an effective dosage of slow neutrons.

12. (Previously presented) The method according to claim 11, further comprising coating the microsphere with a film after heating in the oxidizing atmosphere and before irradiating with an effective dosage of slow neutrons, the film comprising at least one of the compounds selected from silica ( $\text{SiO}_2$ ), titania ( $\text{TiO}_2$ ), alumina ( $\text{Al}_2\text{O}_3$ ),

iron (III) oxide ( $\text{Fe}_2\text{O}_3$ ), silicon nitride ( $\text{Si}_2\text{N}_3$ ,  $\text{SiN}$ ,  $\text{Si}_3\text{N}_4$ ), aluminum nitride ( $\text{AlN}$ ), titanium nitride ( $\text{TiN}$ ), iron nitride ( $\text{Fe}_2\text{N}$ ,  $\text{Fe}_4\text{N}$ ), silicon carbide ( $\text{SiC}$ ) and titanium carbide ( $\text{TiC}$ ).

13. (Previously presented) The method according to claim 8, wherein the melting is performed by allowing the starting material to pass through a high frequency induction thermal-plasma.

14. (New) The method according to claim 8, wherein the starting material is an oxide powder containing yttrium, or yttrium and phosphorous.